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University  
Technology**

Formerly DA-IICT

## **IT643: Software Design and Testing**

**Faculty Name: Prof. Ankush Chander**

**Project Name: GreenCart  
Group Name: NexTech**

### **Team Members**

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## 1. Project Description:-

*GreenCart* is a full-stack online grocery shopping application built using the MERN (MongoDB, Express, React, Node.js) stack. It allows users to browse grocery products, manage a shopping cart, save delivery addresses, place orders, view order history, track order status, and also make online payments. The application supports both **User** and **Seller/Admin** roles with separate dashboards and functionalities for each. Key application logic and business rules are implemented in the backend, while a responsive frontend UI provides seamless interaction for users.



## 2. Problem Statement:-

Traditional grocery shopping requires visiting multiple stores physically and spending a significant amount of time. With rising demand for convenience, there is a need for a digital platform where customers can easily order groceries from their homes. *GreenCart* solves this problem by providing a unified marketplace for grocery products with secure authentication, order management, and seller-side product control.

### 3. Objectives:-

The primary objectives of the GreenCart project are:

- To provide a user-friendly interface for browsing and purchasing grocery items.
- To implement secure user and seller authentication.
- To allow users to manage their cart, addresses, and order history.
- To provide a seller/admin dashboard for managing products and viewing orders.
- To implement robust backend APIs with proper validation and error handling.

### 4. Technologies Used (Tech Stack):-

Layer	Technology
Frontend	React (Vite), Tailwind CSS / CSS
Backend	Node.js, Express

Database	MongoDB (Atlas) with Mongoose ODM
Authentication	JWT (JSON Web Tokens), bcrypt
File Storage	Cloudinary (for product images)
Email	SMTP, NodeMailer
Payment	Stripe
Testing	Jest (Server), Vitest (Client)
Hosting	Vercel



## 5. System Architecture:-

### Frontend Architecture:

React with Vite for fast development, UI rendered using reusable components, context API used for state management (e.g., cart state, user session). Route navigation handled by React Router.

### Backend Architecture:

RESTful APIs created using Express.js. Routes are organized in controllers, models interact with MongoDB

through Mongoose. Middlewares handle authentication and validation.

## **6. Project Features:-**

### **User Features:**

- ✓ Browse grocery categories and products
- ✓ Search products
- ✓ Add/remove products in cart
- ✓ Save addresses
- ✓ Place orders (for delivery)
- ✓ View order history and status

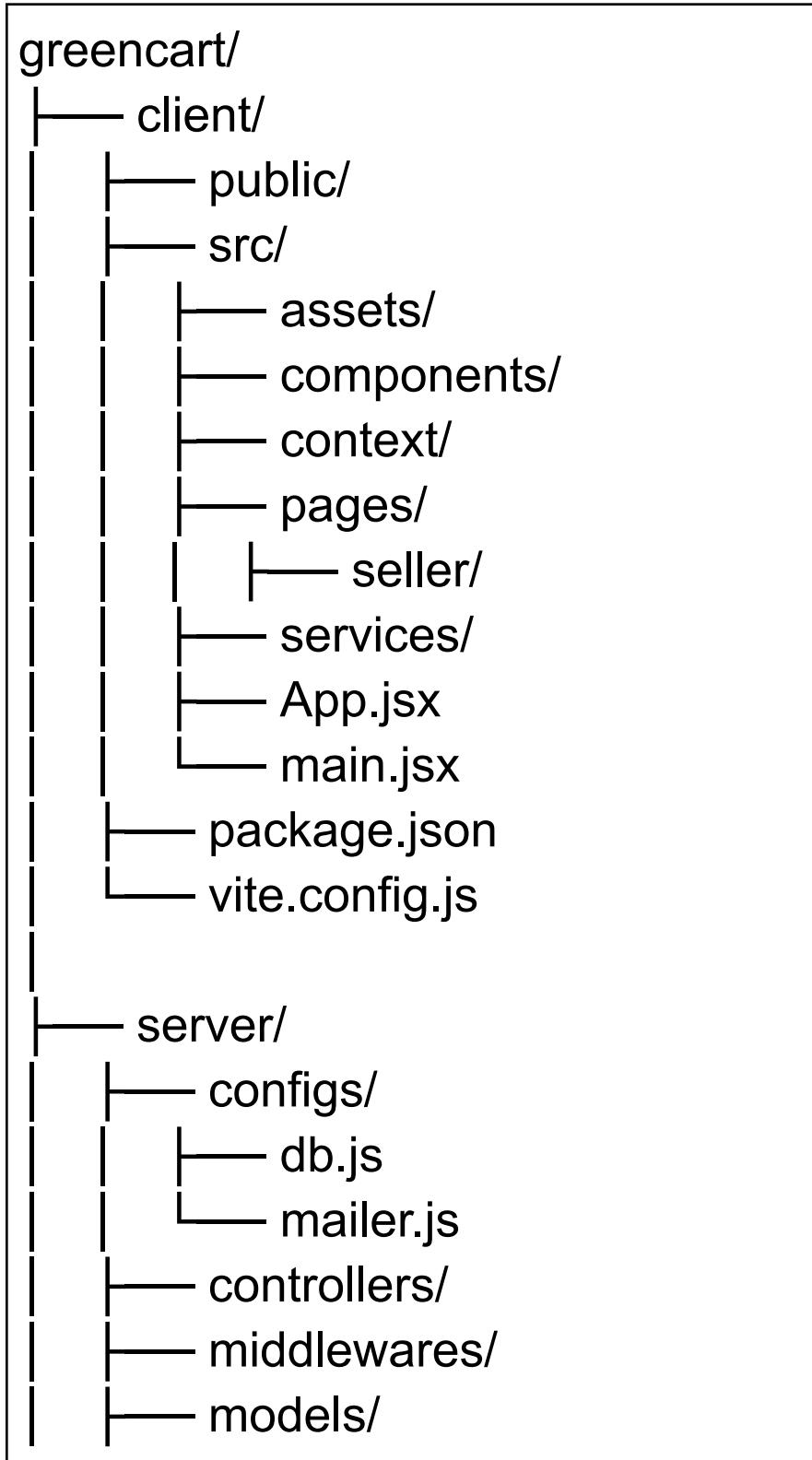
### **Seller/Admin Features:**

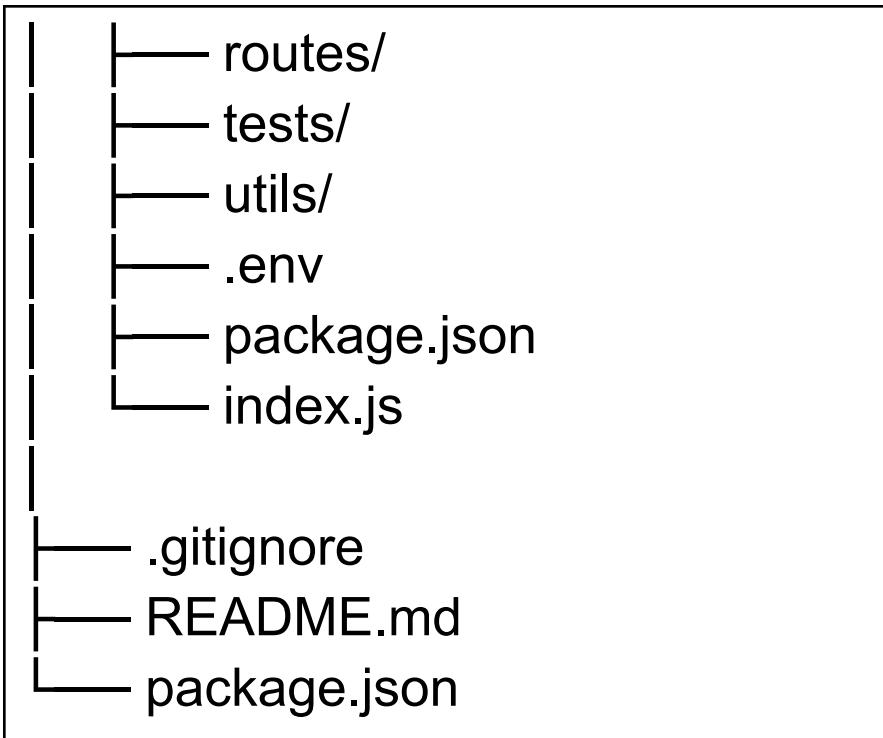
- ✓ Secure login for sellers
- ✓ Add/edit/delete products
- ✓ View all customer orders and order status

### **Shared Features:**

- ✓ Secure authentication with JWT
- ✓ Database persistence with MongoDB
- ✓ File uploads via Multer & Cloudinary

## 7. Folder Structure:-





## 8. Module Descriptions:-

### i. Frontend Modules:

#### **Navbar / Header**

Renders navigation options, displays cart count, toggles login.

#### **Product Listing**

Shows all products with filters and search.

#### **Cart Page**

Manages items, quantities, totals, and checkout button.

#### **Profile & Addresses**

Allows user to view/edit profile and addresses.

## **Authentication Components**

User and seller login components handle JWT-based login.

## **ii. Backend Modules:**

### **Controllers**

Logic for user, product, order, and address operations.

### **Routes**

Defines API endpoints (e.g., /api/products, /api/orders).

### **Middlewares**

Handles authentication and role protection.

### **Configs**

Database connection, environment variables, cloudinary setup.

## **9. Testing:-**

### **i. Server-Side Testing:**

- Used **Jest** and written tests for:
  - Controllers
  - Routes
  - Middlewares
  - Configs

- Mocked database and external dependencies

## ii. Client-Side Testing:

- Used Vitest + React Testing Library
- Tests written for UI components and pages
- Context API state is mocked in tests

This demonstrates a test-driven approach and ensures stable application quality.



## 10. Deployment & GitHub Link:-



GitHub Repo Link:

<https://github.com/ritikkalal12/GreenCart.git>



Deployment Link:

<https://green-cart-er7q.vercel.app/>



## 11. Website Screenshots / UI Views:-

### 1. Homepage:

The screenshot shows the homepage of a grocery delivery website named "GreenCart". At the top, there is a navigation bar with links for "Home", "All Product", and "Contact", along with a search bar and a login button. A shopping cart icon indicates zero items. The main banner features a green background with a repeating fruit and vegetable pattern. It contains the text "Freshness You Can Trust, Savings You will Love!" and two buttons: "Shop now" and "Explore deals →". To the right of the banner is a large image of various fresh fruits and vegetables. Below the banner, the word "Categories" is displayed above seven colored squares, each containing a different food item: vegetables, fruits, oils, Maggi products, dairy, bread, and grains.

## Categories



Organic veggies



Fresh Fruits



Cold Drinks



Instant Food



Dairy Products



Bakery & Breads



Grains & Cereals

## Best Sellers



Vegetables

Potato 500g

★★★★★ (4)

₹19 ₹25

Add



Vegetables

Tomato 1 kg

★★★★★ (4)

₹35 ₹40

Add



Vegetables

Carrot 500g

★★★★★ (4)

₹28 ₹30

Add



Vegetables

Spinach 500g

★★★★★ (4)

₹15 ₹18

Add



Vegetables

Onion 500g

★★★★★ (4)

₹19 ₹22

Add

## Why We Are the Best?



### Fastest Delivery

Groceries delivered in under 30 minutes.



### Freshness Guaranteed

Fresh produce straight from the source.



### Affordable Prices

Quality groceries at unbeatable prices.



### Trusted by Thousands

Loved by 10,000+ happy customers.



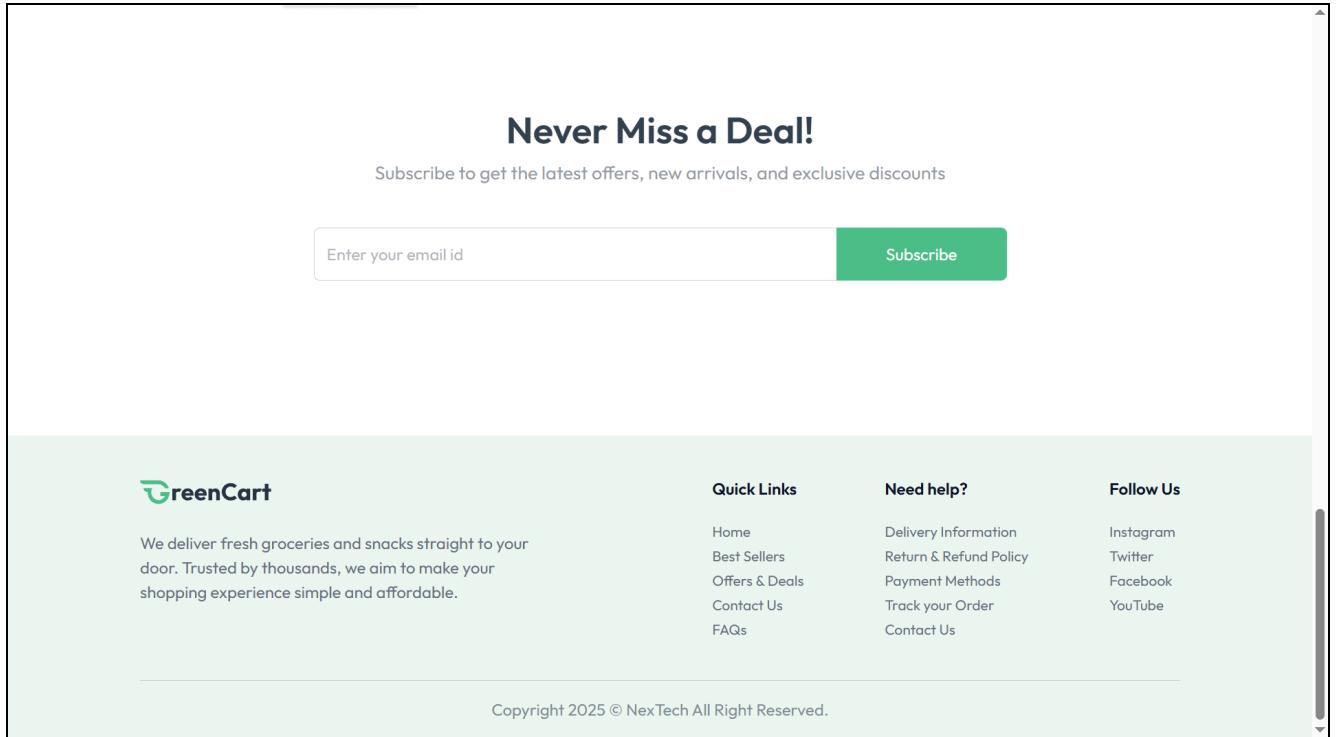
Fast Delivery  
In 30 Min

## Never Miss a Deal!

Subscribe to get the latest offers, new arrivals, and exclusive discounts

Enter your email id

Subscribe



## 2. SignUp Page:

The image shows a user sign-up form overlaid on a screenshot of the GreenCart website. The sign-up form has a light gray background and is titled "User Sign Up". It contains fields for Name, Email, Password, and Confirm Password, each with an "OTP" link next to it. Below these fields is a link "Already have account? click here". At the bottom of the form is a green "Send OTP" button. To the right of the form, there is a decorative image of various fruits and vegetables. The background of the entire image is a screenshot of the GreenCart homepage, which features a banner with the text "Freshness Trust, Sav will Love!", a search bar, and a login button.

**GreenCart**

Home All Product Contact Search products Login

Freshness Trust, Sav will Love!

Shop now Explore

Categories

User Sign Up

Name

Email

Password  Show

Confirm Password  Show

Already have account? [click here](#)

Send OTP

OR

Continue as RITIK ritikkala1234@gmail.com

### 3. Login Page:

The screenshot shows the GreenCart website's login interface. At the top, there is a navigation bar with links for Home, All Product, Contact, a search bar, a shopping cart icon showing 0 items, and a green 'Login' button. A large banner on the left side of the page features the text 'Freshness Trust, Savour will Love!' with buttons for 'Shop now' and 'Explore'. On the right side, there is a decorative image of various fruits and vegetables. The central area contains a 'User Login' form with fields for Email and Password, a 'Create an account?' link, a 'Login' button, and an 'OR' separator followed by a Google sign-in button labeled 'Continue as RITIK ritikkalal1234@gmail.com'.

### 4. All Products Page:

The screenshot displays the 'ALL PRODUCTS' section of the GreenCart website. It features a grid of ten product cards arranged in two rows of five. Each card includes an image of the product, its category, name, rating, original price, discounted price, and a 'Buy Add' button. The products shown are: Potato 500g (Vegetables), Tomato 1kg (Vegetables), Carrot 500g (Vegetables), Spinach 500g (Vegetables), Onion 500g (Vegetables); Apple 1kg (Fruits), Orange 1kg (Fruits), Banana 1kg (Fruits), Mango 1kg (Fruits), and Grapes 500g (Fruits). The layout is clean and organized, with a header containing the GreenCart logo, a search bar, and a user profile icon.

Vegetables		Fruits		
Potato 500g ★★★★★ (4) ₹19 ₹25	Tomato 1kg ★★★★★ (4) ₹35 ₹40	Carrot 500g ★★★★★ (4) ₹28 ₹30	Spinach 500g ★★★★★ (4) ₹15 ₹18	Onion 500g ★★★★★ (4) ₹19 ₹22
Apple 1kg ★★★★★ (4) ₹110 ₹120	Orange 1kg ★★★★★ (4) ₹75 ₹80	Banana 1kg ★★★★★ (4) ₹45 ₹50	Mango 1kg ★★★★★ (4) ₹140 ₹150	Grapes 500g ★★★★★ (4) ₹65 ₹70

## 5. Product Category Page:

**GreenCart**

Home All Product Contact Search products

**ORGANIC VEGGIES**

Vegetables Potato 500g ★★★★ (4) ₹19 ₹25 Add

Vegetables Tomato 1kg ★★★★ (4) ₹35 ₹40 Add

Vegetables Carrot 500g ★★★★ (4) ₹28 ₹30 Add

Vegetables Spinach 500g ★★★★ (4) ₹15 ₹18 Add

Vegetables Onion 500g ★★★★ (4) ₹19 ₹22 Add

**GreenCart**

We deliver fresh groceries and snacks straight to your door. Trusted by thousands, we aim to make your shopping experience simple and affordable.

**Quick Links**

- Home
- Best Sellers
- Offers & Deals
- Contact Us
- FAQs

**Need help?**

- Delivery Information
- Return & Refund Policy
- Payment Methods
- Track your Order
- Contact Us

**Follow Us**

- Instagram
- Twitter
- Facebook
- YouTube

## 6. Product Details Page:

**GreenCart**

Home All Product Contact Search products

Home / Products / Fruits / **Mango 1kg**

A large mango with a green leaf, a slice of mango, and a diced mango.

**Mango 1kg**  
★★★★ (4)

MRP-₹150  
**MRP: ₹140**  
(inclusive of all taxes)

**About Product**

- Sweet and flavorful
- Perfect for smoothies and desserts
- Rich in Vitamin A

Add to Cart

Buy now

**Related Products**

## 7. Shopping Cart Page:

**GreenCart**

Home All Product Contact Search products

### Shopping Cart 3 Items

Product Details	Subtotal	Action
<b>Mango 1kg</b> Weight: N/A Qty: 1	₹140	
<b>Apple 1kg</b> Weight: N/A Qty: 1	₹110	
<b>Chocolate Cake 500g</b> Weight: N/A Qty: 1	₹325	

[← Continue Shopping](#)

**Order Summary**

**DELIVERY ADDRESS**  
41 BHARDAJAL Apartments,  
Ahmedabad, Gujarat, India [Change](#)

**PAYMENT METHOD**

Price	₹575
Shipping Fee	Free
Tax (2%)	₹11.5
<b>Total Amount:</b>	<b>₹586.5</b>

## 8. Add Address Page:

**GreenCart**

Home All Product Contact Search products

### Add Shipping Address

First Name	Last Name
Email address	
Street	
City	State
Zip code	Country
Phone	

## 9. Online Payment Page:

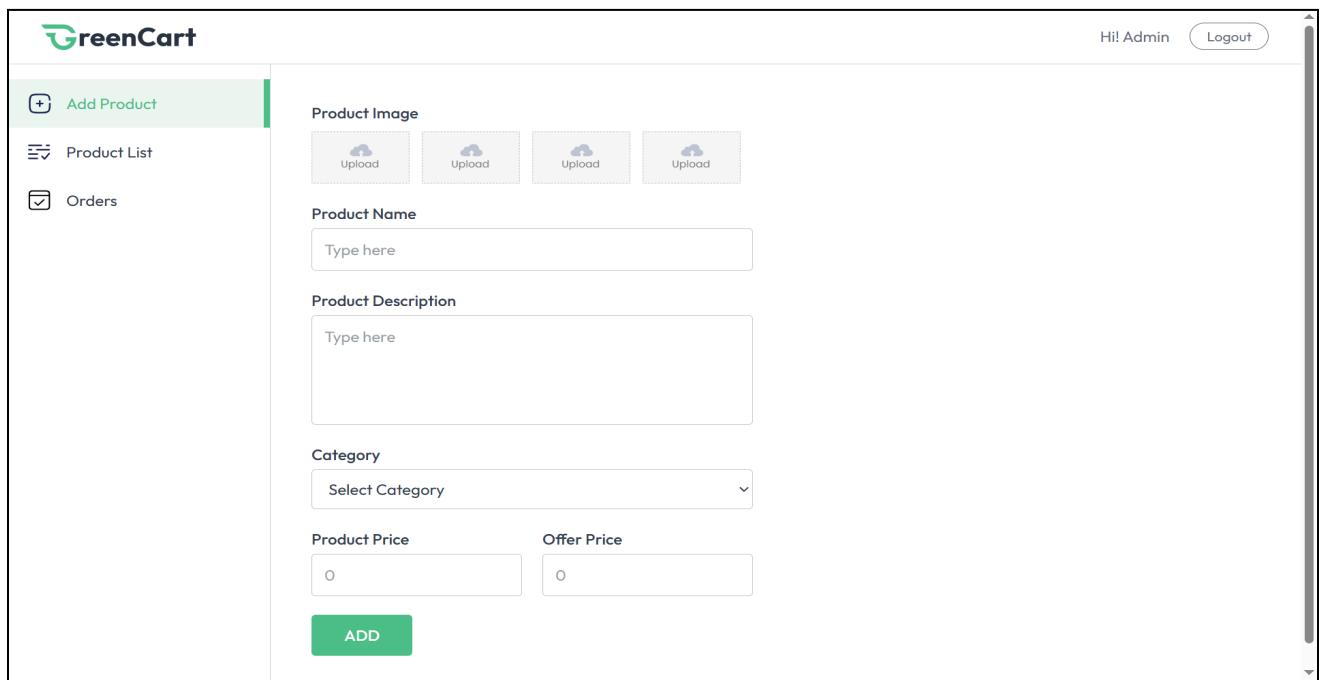
The screenshot shows an online payment interface for a business sandbox. At the top left, there's a back arrow, a refresh icon, and the text "New business sandbox". To the right, it says "Sandbox". A large green button at the top right says "Pay with ⏪ link". Below it, a grey bar says "OR". There's a "Email" input field with "email@example.com" and a "Payment method" section. Under "Card information", there's a placeholder card number "1234 1234 1234 1234" with icons for Visa, Mastercard, American Express, and Discover. Below that are fields for "MM / YY" and "CVC" with the value "123". There's also a "Cardholder name" field with "Full name on card" and a "Country or region" dropdown set to "India". A checkbox labeled "Save my information for faster checkout" is checked, with a note below it: "Pay securely at New business sandbox and everywhere Link is accepted." At the bottom is a large blue "Pay" button.

## 10. My Orders Page:

The screenshot shows the "MY ORDERS" page of a website called "GreenCart". The header includes the logo, navigation links for "Home", "All Product", "Contact", a search bar with "Search products", a shopping cart icon with "0", and a user profile icon. The main content area has a heading "MY ORDERS". Below it is a table listing three orders. Each row contains a product image, name, category, quantity, status, date, and amount. At the bottom of the table are buttons for "Download Invoice" and "Cancel Order".

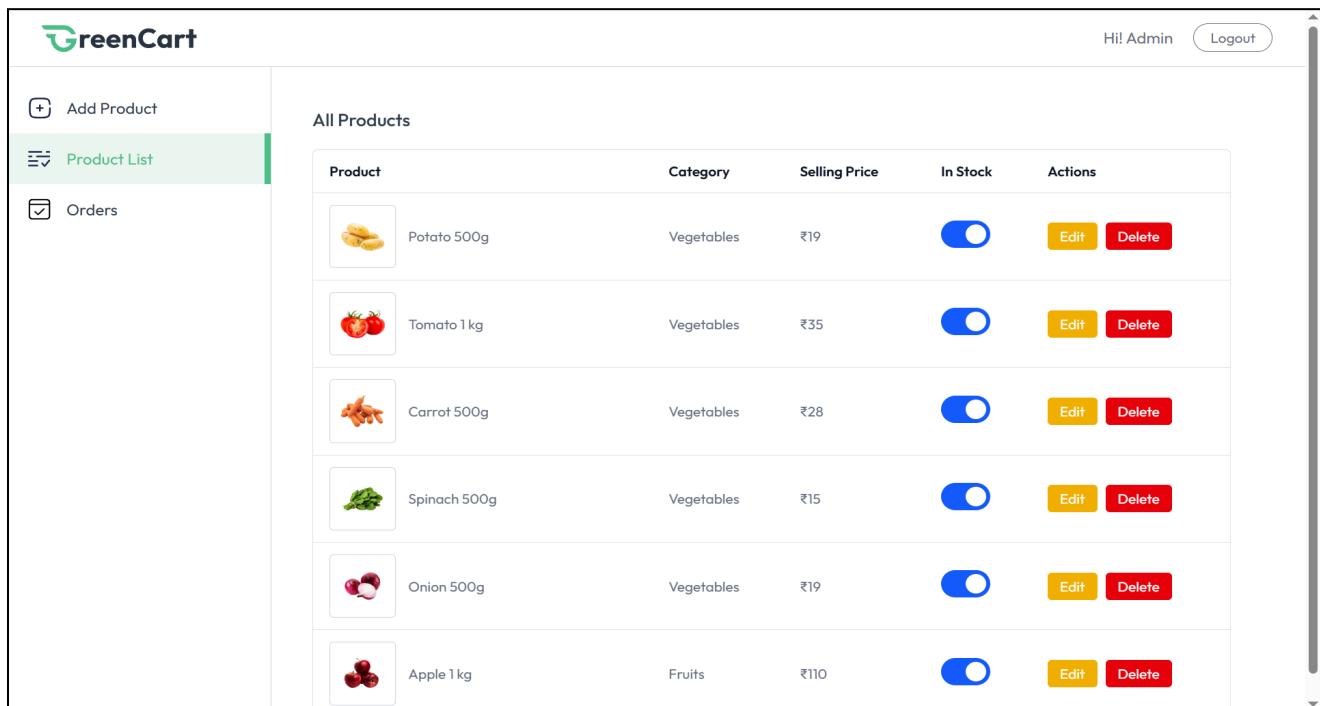
Order Id	Payment	Total Amount
693b26923bfe0a18dd630dc7	Online	₹586
Mango 1kg	Quantity: 1 Status: Order Placed Date: 12/12/2025	Amount: ₹140
Apple 1kg	Quantity: 1 Status: Order Placed Date: 12/12/2025	Amount: ₹110
Chocolate Cake 500g	Quantity: 1 Status: Order Placed Date: 12/12/2025	Amount: ₹325

## 11. Add Product Page: (Admin Side)



The screenshot shows the 'Add Product' form in the GreenCart admin interface. On the left, a sidebar menu includes 'Add Product' (highlighted in green), 'Product List' (selected and highlighted in green), and 'Orders'. The main area contains fields for 'Product Image' (with four placeholder upload boxes), 'Product Name' (text input 'Type here'), 'Product Description' (text area 'Type here'), 'Category' (dropdown 'Select Category'), 'Product Price' (input '0'), 'Offer Price' (input '0'), and a large green 'ADD' button at the bottom.

## 12. Product Lists Page:



The screenshot shows the 'All Products' list in the GreenCart admin interface. The sidebar menu shows 'Add Product', 'Product List' (selected and highlighted in green), and 'Orders'. The main table lists six products: Potato 500g, Tomato 1kg, Carrot 500g, Spinach 500g, Onion 500g, and Apple 1kg. Each row includes a product thumbnail, name, category (Vegetables for all except Apple), selling price (₹19, ₹35, ₹28, ₹15, ₹19, ₹110), an 'In Stock' toggle switch (all are on), and 'Edit' and 'Delete' buttons.

Product	Category	Selling Price	In Stock	Actions
Potato 500g	Vegetables	₹19	<input checked="" type="checkbox"/>	<button>Edit</button> <button>Delete</button>
Tomato 1kg	Vegetables	₹35	<input checked="" type="checkbox"/>	<button>Edit</button> <button>Delete</button>
Carrot 500g	Vegetables	₹28	<input checked="" type="checkbox"/>	<button>Edit</button> <button>Delete</button>
Spinach 500g	Vegetables	₹15	<input checked="" type="checkbox"/>	<button>Edit</button> <button>Delete</button>
Onion 500g	Vegetables	₹19	<input checked="" type="checkbox"/>	<button>Edit</button> <button>Delete</button>
Apple 1kg	Fruits	₹110	<input checked="" type="checkbox"/>	<button>Edit</button> <button>Delete</button>

## 13. Orders History Page:

The screenshot shows the 'Orders' section of the GreenCart admin interface. On the left sidebar, 'Orders' is selected. The main area displays four order cards:

- Order 1:** Ritik Kalal, 41 BHARDAJAL Apartments, Ahmedabad, Gujarat, 380002, India. Total: ₹586. Status: Order Placed.
- Order 2:** Ritik Kalal, 41 BHARDAJAL Apartments, Ahmedabad, Gujarat, 380002, India. Total: ₹586. Status: Cancelled.
- Order 3:** Ritik Kalal, 41 Swastik Apartment Navrangpura , Ahmedabad, Gujarat , 380002, India. Total: ₹229. Status: Delivered.
- Order 4:** Ritik Kalal, 41 Swastik Apartment Navrangpura , Ahmedabad, Gujarat , 380002, India. Total: ₹117. Status: Pending.

Each card lists the items ordered, their quantities, and the total price.

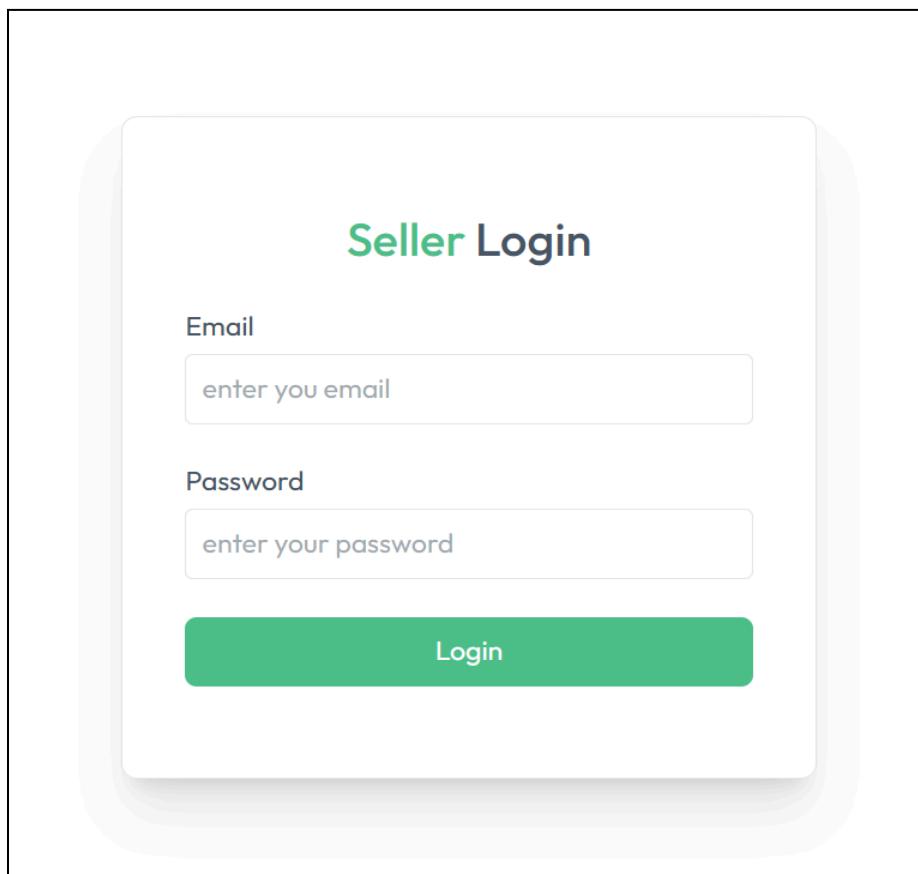
## 14. Order Details Page:

The screenshot shows the 'Order Details' page for Order ID 693b26923bfe0a18dd630dc7. The sidebar shows 'Orders' is selected. The main content includes:

- Order Details:** Shows the order summary with items: Mango 1kg (Qty: 1 - ₹150), Apple 1kg (Qty: 1 - ₹120), and Chocolate Cake 500g (Qty: 1 - ₹350).
- Shipping Address:** Ritik Kalal, 41 BHARDAJAL Apartments, Ahmedabad, Gujarat 380002, India. Phone: 8290332404.
- Payment:** Method: Online, Status: Paid.
- Status:** A dropdown menu for 'Order Status' shows options: Pending, Picked Up, On The Way, Delivered (which is highlighted in blue), Cancelled, and Delivered. A 'Update Status' button is next to it.

A vertical sidebar on the right shows a list of previous orders with their details and status.

## 15. Seller Login: (Admin)



## 📌 12. Conclusion:-

GreenCart is a comprehensive grocery shopping platform that showcases full-stack development skills including authentication, database design, REST API implementation, testing, and responsive UI. The project is optimized for maintainability and expandability, demonstrating real-world application structure and quality assurance practices.